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CENTRAL INTELLIGENCE AGENCY

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SUBJECT Production of Receiver Klystrons
723 A/B and 726 A

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SUPPLEMENT TO REPORT NO.
50X1-HUM

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1. Receiver Klystron 723 A/B

a. Operating conditions:

Dia. 3.2 cm (tunable from 3.1 cm. through 3.45 cm.)
Pw 6 MW average
Uz 300 V, Ia approx. 30 mA (anode voltage and current)
UR: -20.....-150 V (probably resonator grid voltage)

b. Production technique:

Similar to the reflex klystron.
Advantages: simple tuning, low voltage operation.
Disadvantages: marked plate dissipation (9%), low overall efficiency—0.05-0.3%.

c. Period from Autumn 1945 to January 1947, inclusive:

Production of the first model was similar to that of Telefunken type LD 20 (resonator base diameter 26 mm.). Later an imitation of the American 723 A/B was produced. The resonator base had a diameter of 26 mm. with departures such as a separated base ring. A concentrator was used instead of a piston-welding machine. The welding was at first unsatisfactory, but a solution was found in the use of "Mifosil".

Comment: Probably a silver solder.

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Molybdenum, annealed in H₂, was used for leads in the glass envelope (glass 756f). Disadvantages of molybdenum: acid precipitation, low insulation resistance. "Tenico" wires, produced at the Oberspreewerk, were substituted for the molybdenum leads.

The oscillator output (P_o) was too low and the oscillation was unstable. Adjustment of the coupling loop was achieved by means of a decrease in the insertion depth and a reduction of the spacing between grid 2/grid 3 in front of the [flexible] diaphragm.

Oxide-resistant steel base plates were used after the glass envelope had been nickel-plated. The resonator base was made of K-iron (special radio iron) or deep-drawn iron ST VIII 23, on which nickel varnish was reduced before hot-dip silver plating.

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Results: P_o negative, poor emission, short circuits and leaky tubes.

d. New Operating Data:

D - 3.2 cm. (tunable from 3.14 through 3.43 cm.)
 P_o - 5 mW
 U_R - 0 to -300 V
 I_a - 30 mA

e. Period from February to March 1947:

The insertion depth of the coupling loop was increased.

In March new production data were plotted as of the first of the month and forwarded to the USSR. A wave and output meter was likewise sent to the USSR, and a new wavemeter was designed.

The tubes designed during the second quarter of 1947 attained a maximum oscillator output of 21 mW. and efficiency was raised as much as 12.7%.

2. Receiver Klystron 726 A

a. Operating Conditions:

D - 9.1 cm. (tunable from 8 through 10.5 cm.)
 P_o - approximately 10 mW.
 U_a - 300 V, I_a - approximately 30 mA
 U_R - -20.....-100 V

b. Production was carried out along American lines.

c. New Operating Data:

D - 10.5 cm. (tunable from 9.93 through 10.9 cm.)
 P_o - 10 mW
 U_a - + 300 V, I_a (30 mA)
 U_R - 0.....-250 V

d. To secure longer wave lengths, grid #1 was fitted with an annular additional capacitance, and the optimum size of this ring was determined by tests. Technological development was similar to that of klystron 723 A/B with the exception that the satisfactory tubes attained a maximum efficiency of 25% and an oscillator output of as much as 78 W with a slight decrease at longer wave lengths.

Remodelling through the introduction of metal-ceramic leads for the reflector, following American techniques as closely as possible, but with the omission of the spacing ring and suspension of the Wehnelt cathode, was carried out by the end of the second quarter of 1947: the first models are now being perfected.

e.

Type	Period	No. of Designed and Completed Units	No. of Satisfactory Tubes
723 A/B	Autumn 1945 to Jan. 1947	Approx. 200	---
	February/March 1947	310	23
	April/June 1947	552	44
	July 1947	243	34
726 A	Autumn 1945 to Jan. 1947	Approx. 100	---
	February/March 1947	103	25
	April/June 1947	132	19
	July 1947		---

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